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THE MNPI STUDY:

Measures of Strength for Maternal Health Programs in 55 Developing Countries

by

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Introduction

Ministries of health in every country conduct programs to improve maternal and neonatal health, but standard evaluations of these programs are nearly nonexistent. This deficiency limits comparisons through time and across borders, and constrains analyses that could guide administrative improvements. Maternal mortality ratios and numbers of maternal deaths in the developing world are extraordinarily higher than those in developed countries, and the paths to improvements can be clarified by systematic evaluation. The research reported here concerns the Maternal and Neonatal Program Effort Index (MNPI), a standardized assessment instrument applied in both 1999 and 2002. Previous reports cover the detailed methodology and the results from the 1999 study, as well as the relation of the MNPI ratings to maternal mortality ratios (Ross, Campbell, and Bulatao, 2001; Bulatao and Ross, 2002; Bulatao and Ross, 2003a).

The MNPI instrument is designed to measure the strength and character of government programs to improve maternal health. It contains items for the most proximate determinants of maternal survival, including those related to emergency obstetric and abortion cases, as well as the less proximate determinants of the policies and institutional arrangements necessary to build treatment capacities. Capturing these program features can document the low effort levels that now exist and create a baseline against which to trace future improvements. The overall purpose is to measure program inputs and strength of effort for the reduction of maternal mortality and morbidity and closely related neonatal items.

A similar index, developed for family planning, has been used since the early 1970s and has proved useful to show levels and trends, as well as regional differences, for different types of effort. It covers policies and regulations, various service arrangements, monitoring and evaluation, and contraceptive provision. It gathers data through questionnaires completed by various types of respondents in about 100 developing countries. A 27-year period has now been covered in five rounds of investigation (1972, 1982, 1989, 1994, and 1999).[1]

A parallel index has also been developed for HIV/AIDS programs. Known as the AIDS Program Effort Index (API), it covers 10 features of HIV/AIDS programs, each with a number of detailed items. The index was applied in 2000 and 2002, providing profiles of international and national program efforts and measuring the availability of key prevention and care services (UNAIDS, USAID, and POLICY Project, 2001; USAID et al., 2003).

The conceptual framework employed for the MNPI study appears in Figure 1. It depicts the relationship between program efforts and improved health outcomes within a broad context. The *Inputs* (column 1) include the social/cultural and individual factors, the political and administrative system, and the organizational structure of safe pregnancy services. Despite the influence that social/cultural and individual factors have on maternal and perinatal mortality, those factors are beyond the immediate control of an action program. Therefore, for the purpose of measuring program effort, the index is designed to assess only the political and administrative systems and the organizational structure of safe pregnancy services. Similarly, for *Process* and *Outputs* of the program, pregnancy status and service demand (top of columns 2 and 3) are comparatively distant determinants of maternal/perinatal health and lie outside the scope of the program itself. Therefore, only safe pregnancy services and service outputs are measured.

[1] The results of the most recent round can be found in Ross and Stover, 2001.

Reading across the columns along the "Supply" line, the political and administrative system and the organizational structure will strongly affect operations and service outputs. Those, in turn, will have a direct effect on the *Outcomes* (column 4) for the health of women and newborns.

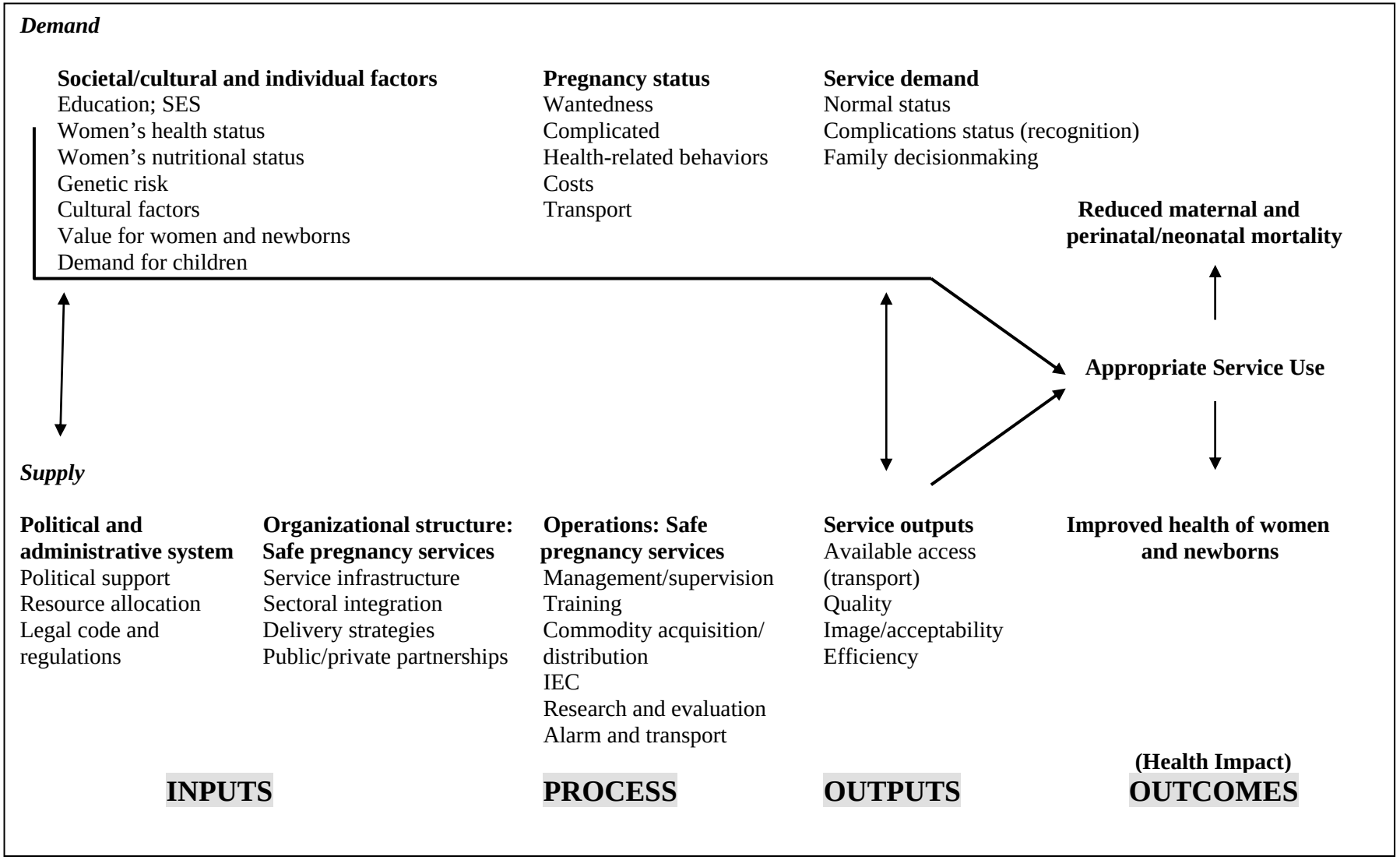
The MNPI is intended to measure the effort put into the reduction of maternal and neonatal mortality. It does not measure the social/cultural or individual context, nor does it measure the outcomes. The index is designed to assess only the inputs, process, and outputs as they relate to the "Supply" or program side of the conceptual framework.

There are four potential applications of the MNPI Index:

Description:	to measure both the types and levels of effort, and changes over time
Diagnosis:	to identify areas of strength and weakness
Planning:	to document program experience to aid planning by individual governments and international supporting agencies
Stimulus:	to encourage policy and program improvements by revealing both shortcomings and successes, for use by advocacy groups

These applications are considered further in the discussion of the results from the 1999 and 2002 rounds.

Figure 1. Conceptual Framework of Safe Pregnancy Program Demand and Supply: Program Impact on Maternal/Perinatal Mortality and Improved Health



Source: Indicators for Reproductive Health Program Evaluation: Final Report of the Subcommittee on Safe Pregnancy. The EVALUATION Project. 1995.

Methods

A literature review and consultations with maternal health specialists identified some 13 components of program effort associated with maternal health programs. Individual questionnaire items, averaging about six items per component, for a total of 81, were drafted and pretested, including trials in selected developing countries, to design the final 1999 questionnaire (which was replicated in 2002). Respondents were instructed to rate a program item as zero if it was absent or extremely weak, and five if it was optimal. Intermediate situations received scores between zero and five.[2] For easier comparison across components, all scores were converted to a maximum of 100. Because the number of items in each component varied, their mean value was employed as the component score. The total score, in turn, was the mean of the 13 component means.

In 1999 and 2002, data were obtained from 10 to 25 expert observers in each country. They were selected for close familiarity with the national maternal health program and chosen from several professional and institutional backgrounds. To obtain a range of viewpoints, respondents were selected from numerous organizations, including the Ministry of Health, other ministries, NGOs, donor representatives, academic and community-based groups, and others. The number of respondents in each country varied, as some developing countries have a larger pool of knowledgeable observers than others.

The MNPI methodology, like the family planning and the HIV/AIDS methodologies, permits the inclusion of some variables for which no ordinary quantitative measures exist but for which persons conversant with the program can give ratings along a scale from weak to strong effort. Experience with these ratings in 1999 and with the change in scores in the 2002 study showed close parallels in patterns and levels, as did the extensive analyses conducted on the measures of program effort relating to the family planning and HIV/AIDS data. With this approach, common variables can be obtained on many countries, in a relatively short time, and at modest cost, permitting replications every few years.

[2] An exception concerned the items that asked for the percentage of the population having adequate access to certain services. For those, an estimated percentage figure was requested.

Results

Coverage of the developing world was reasonably complete in both 1999 and 2002, encompassing 84 percent and 90 percent of the total populations in the two years, including the eight most populous countries (China, India, Indonesia, Pakistan, Bangladesh, Brazil, Mexico, and Nigeria). Coverage improved somewhat from 49 countries in 1999 to 55 countries in 2002, especially because of the inclusion of more countries in francophone sub-Saharan Africa. Coverage in East and Southeast Asia increased from 90 percent to 92 percent of the region's population, in Latin America and the Caribbean from 71 percent to 83 percent, in francophone sub-Saharan Africa from 58 percent to 84 percent, and in the Middle East and North Africa from 46 percent to 58 percent. In Anglophone sub-Saharan Africa, coverage remained constant at 97 percent, and in South Asia it decreased from 98 percent to 97 percent.

Total Scores by Region

It is important to examine the overall scores both as country averages and as population-weighted averages. It is one thing to treat all countries equally, so that a large country such as India or China has no more importance than any other country, but quite another to give each country's score a weight that matches its population size. In that case a large country with an unusually high or low score disproportionately affects the average. The advantage is that such an average reflects the situation of most people in the region. Both kinds of averages are of interest, and both are shown below. As it happens, the weighted global score is only two points higher, reflecting the above-average performance by some of the larger countries.

Overall program performance is somewhat above half of the maximum effort. The total score is either 58 or 60, depending upon the weights. The regional variation increases with population weights; the larger countries in the Middle East and North Africa score above average, while the larger countries in Anglophone sub-Saharan Africa score below average (see Table 1).

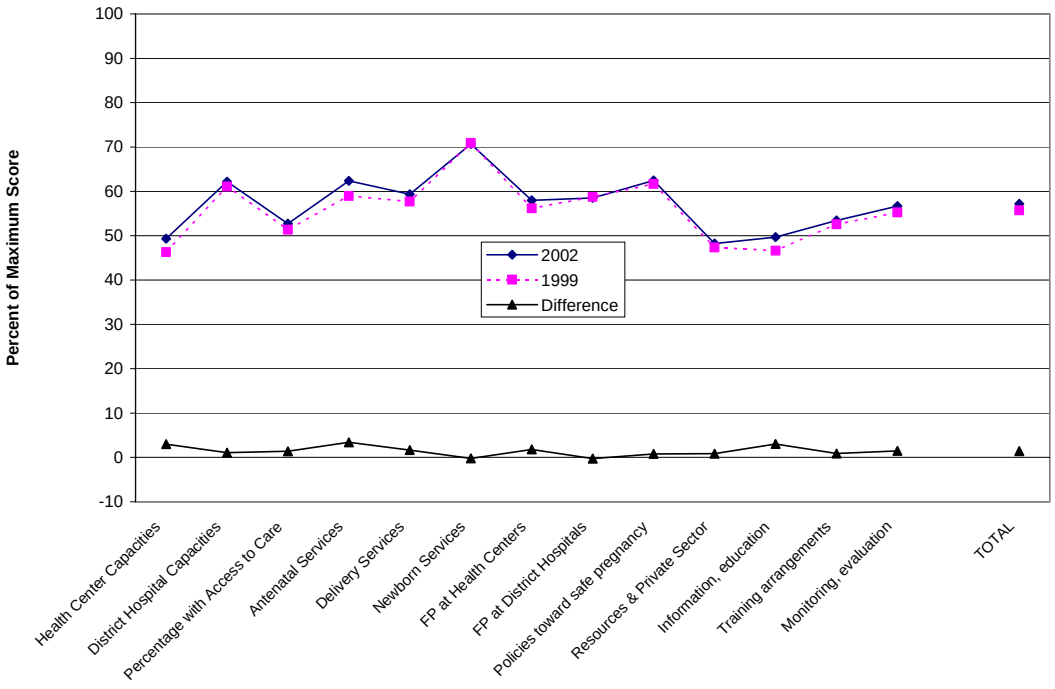
Table 1. Total MNPI Scores by Region

Region	Unweighted	Weighted	No. of Countries
Asia	58.1	60.8	9
Latin America	57.6	56.8	12
Middle East/North Africa	61.2	64.7	7
Anglophone Sub-Saharan Africa	60.0	56.3	14
Francophone Sub-Saharan Africa	54.3	53.0	13
All Regions	**58.0**	**60.0**	**55**

Component Scores for 2002 and 1999

Between 1999 and 2002, every component score improved, but by small amounts (Figure 2, based on the 43 countries that were common to both studies). For those 43 countries, the total score rose by 2.3 percent, from 54.9 in 1999 to 57.1 in 2002.

Figure 2. Comparison of 2002 and 1999 Surveys, by Component (43 Countries Included in Both Years)



Remarkably, the pattern of effort and the levels of effort across the 13 components were nearly identical in 1999 and 2002, even though the two investigations were conducted independently. A minor qualification to independence was that in some of the 43 overlapping countries the same respondents were used in 2002 whenever the person was still available and still conversant with the national program. That helped to reduce one source of variance in the change estimates. Respondent memories of their 1999 ratings were not considered a problem given the three-year gap and the large number of items (81) on the questionnaire. The similarity in pattern and level as shown in Figure 2 is both reassuring as to the reliability of the methodology and suggestive of the slow pace of change in the detailed features of the programs when averaged over all countries. That is, no overreaching technological change or fundamental modification in field practices occurred in national efforts to reduce the high levels of maternal mortality.

The highest rated of the 13 components is for newborn services, at 70 percent in both years, which is due in part to the inclusion of two items for immunizations that score high, reflecting the successful Expanded Program of Immunization (EPI) campaigns of the last few decades. Three components nearly tie for last place, at about 50 percent of maximum effort: health center capacities, resources, and public education. The access component is close to 50 percent, but is markedly different between rural and urban areas. Six of the other nine components run at about 60 percent of maximum: district hospital capacities, antenatal and delivery services, family planning at health centers and district hospitals, and policies that bear on safe pregnancy. The other two, components for training and monitoring/evaluation, are near 55 percent. The overall range of differences is large, from about 45 percent to 70 percent; that gap of 25 points testifies to a strong selectivity in what government programs emphasize.

Regional Patterns by Component

The global pattern for effort is considerably different both by region and by component. Table 2, based upon the 2002 data for all 55 countries, shows the corresponding mean values.

Table 2. Average Scores by Component and Region, 2002

Component	East and Southeast Asia	South Asia	Latin America and the Caribbean	Middle East and North Africa	Anglophone Sub-Saharan Africa	Francophone Sub-Saharan Africa	All Regions
1. Capacities of health centers	52.6	45.4	49.3	50.8	51.5	54.7	**51.3**
2. Capacities of district hospitals	65.9	58.8	61.8	75.6	61.4	58.5	**62.8**
3. Total access	70.2	37.2	56.1	68.8	54.4	39.6	**53.3**
3a. Rural access	62.2	30.7	40.6	53.8	45.5	30.5	**42.4**
3b. Urban access	85.1	59.2	67.6	80.9	71.0	58.4	**69.0**
4. Care at antenatal visits	60.5	50.0	65.9	58.7	67.9	67.4	**64.2**
5. Care at delivery	68.2	42.7	62.6	62.8	61.2	57.7	**60.2**
6. Care for newborns	75.1	57.0	75.7	76.8	72.0	70.0	**72.1**
7. Family planning at health centers	62.5	47.4	56.2	65.5	65.9	51.0	**58.6**
8. Family planning at district hospitals	68.2	59.8	59.3	57.3	61.4	51.1	**58.5**
9. Policies toward safe pregnancy	69.0	57.6	58.4	60.8	65.6	67.0	**63.5**
10. Resources	50.9	50.4	48.8	55.6	52.4	37.6	**48.2**
11. Information, education	61.8	51.5	41.4	51.8	53.6	50.0	**50.5**
12. Training arrangements	63.5	50.1	56.3	56.1	52.8	47.6	**53.5**
13. Monitoring, evaluation	65.8	48.6	57.4	55.3	59.7	54.2	**57.1**
Total Score	**64.2**	**50.5**	**57.6**	**61.2**	**60.0**	**54.3**	**58.0**

The South Asia countries of Bangladesh, India, Nepal, and Pakistan as a group have the lowest total score among the various regions and are lowest or tied for lowest on most of the components. Francophone sub-Saharan Africa is next lowest, both on the total score and on the number of components for which it ranks at the bottom. The best scoring region, East and Southeast Asia, holds the highest total score and is highest on most of the separate components. The other regions fall at intermediate levels.

The regions are far apart on the three access indicators (total, rural, and urban); the scatter is far greater for them than for any other component. It is remarkable how greatly public access to maternal services differs geographically and how greatly this occurs within the generally low rural values and also within the generally high urban values. Measures of dispersion across the regions are much higher for access than for any other components, indicating that the infrastructures basic to widespread service delivery are what differ most from one region to another. They are considerably weaker in South Asia and francophone sub-Saharan Africa than elsewhere.

Urban access scores are far higher than rural ones; the gap is 26–28 percent in every region. All the urban scores lie above every rural score except one.

Apart from access, four of the regions are remarkably close on each component. Excepting the especially low values of South Asia and the especially high values of East and Southeast Asia, the other four regions are surprisingly homogeneous in their component scores. Partial exceptions occur for the two family planning components, where variation is somewhat greater, and for public information, where Latin America scores quite low. Overall, the four regions tend to move up or down together across the various components, with francophone sub-Saharan Africa lowest.

The 81 Program Measures, 1999 and 2002

To keep the questionnaire length within bounds, and to reduce respondent fatigue, each component was measured by a limited number of items, choosing ones that would be individually important but would also—to an extent—represent others thought to be closely correlated. Results for each of the 81 items were ranked in order, using the all-country average for each item ("1" denotes the highest scoring item, "81" denotes the lowest scoring item).

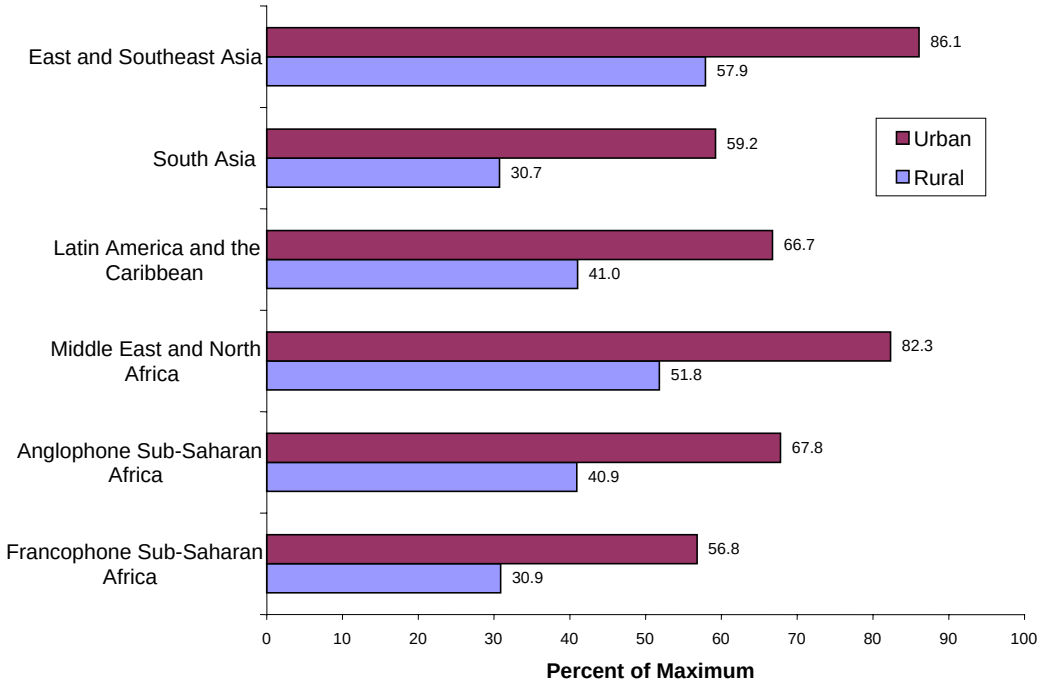
As the results in Appendix A show, most changes from 1999 to 2002 were quite modest, but the items within each component vary considerably in their levels.

Components 1 and 2, containing 10 items, are concerned with facility capacities in health centers (peripheral level) and district hospitals (next higher level). Health centers ranked well on the ability to administer antibiotics intravenously, and relatively poorly for manually removing retained placentas and arranging transport for cases of obstructed labor, an especially important feature. Worst of all was the capacity to perform either manual or electric suction of the uterus, which ranked 80th out of the 81 items.

District hospitals, as expected, scored much better, both for the group of items for health centers and for the additional function of surgical deliveries. They did less well for performing blood transfusions, partly for lack of supplies.

Component 3 for public access to services in rural areas contained many of the lowest ranking items in the entire study, with six of eight items ranked at 68 through 81. The scores shown are interpretable as actual percentages, as the questionnaire asked directly for the respondent's estimate of the percentage of women with access to each service. Urban areas, in contrast to rural areas, ranked quite high on all but one of the eight items, excepting only the provision of safe abortion services. The rural-urban contrast is remarkable. It exists in every region (Figure 3) and also in nearly every country. Most of the population in developing countries resides in rural areas, and the risks at delivery are higher in rural areas, reflected in the low percentages having access to attendance at birth by trained personnel, or access to treatment for postpartum hemorrhage, for obstructed labor, and for abortion complications. Access is also poor for postpartum family planning services, which makes a subsequent conception likely to occur sooner than desired, with a short birth interval that raises the risks to both mother and infant.

Figure 3. Rural and Urban Access Scores, by Region, 2002



Components 4–6 are concerned with the antenatal-delivery-neonatal cluster; they contain many of the highest-ranking items, and the average scores, though ranging no higher than 60–72 percent, are among the highest of the 13 components. For antenatal care, the six items are weak only for syphilis and HIV-related services; yet they improved noticeably during the three years between surveys. For delivery care, the weaknesses are for professional attendance, emergency care, labor monitoring, and regular check-ups. For neonates, the scores are high, reflecting especially the success of immunization campaigns in recent decades.

Components 7 and 8, for family planning provision at health centers and district hospitals, are mixed. As expected, district hospitals do better for pill and IUD provision, and for postpartum and postpartum family planning services, but district hospitals do not score well for female sterilization and they score poorly for male sterilization. There is considerable regional variation in these respects; in general, much room for improvement exists.

Components 9–13 are concerned with the support functions that are generally centralized at the national level:

- Policy positions rank well; among all the functions, they are the easiest for governments to establish in a noncontroversial area such as maternal health. The two lowest items concern treatment of abortion complications and specific action plans.

- Resources do less well, as measured here. "Adequate budget" ranks 65th among the 81 items, and contributions from active private sectors are unimpressive. However, most services are clearly not free, so the additional income collected from fees would relieve the pressure on government budgets to some extent.

- Health Promotion activities rank rather poorly: Education materials are not widespread, community organizations could do much more, and the media fall short in educating the public about pregnancy complications and harmful practices. Ministries of health have some distance to go to advance these activities.

- Training functions score poorly except for the inclusion of hands-on training in medical curricula. Otherwise, the scores are low for both refresher training and for the training of new personnel.

- Monitoring and research activities fall into an intermediate range, except for a lack of facility listings and the inadequacy of hospital reviews of maternal deaths. Otherwise, statistical systems of sorts exist and some use is made of them.

Looking across the whole set of 81 items, the highest ranking items fall under the antenatal, delivery, and newborn components: of the 12 scores above 70 percent, eight are from these components and two others are closely related: for urban access to antenatal care and to attended delivery care.

The 12 lowest-ranking items (below 45 percent) are more varied and are symptomatic of serious shortcomings. Four concern rural access to care. Another two concern rural abortion access and health center capacity for either manual or electric suction aspiration; in fact, these two rank 80th and 81st. Two items concern training of new nurses/midwives or doctors. One other item is for HIV counseling/testing at antenatal visits and another is for the provision of male sterilization. Two other items concern scheduling for postpartum checkups within 48 hours of delivery and free provision of all services and drugs.

Country Variation

Country scores are similar for some of the 81 questionnaire items but quite different for others (see Appendix: 2002 Ratings by Country and Component). For the policy items, the scores are rather similar across countries, and they are relatively high. Standard deviations are often large for high means, so it may be surprising that in this case the standard deviations are low; however, because the original scores run from zero to five there may be crowding of scores near the upper limit of five, constraining the room for variation. Crowding of scores can also occur at scores near zero. Regardless, the resulting picture is one of rather uniformly high scores regarding policy positions. The same observation holds for immunization services: high scores with relatively little variation among countries compared with other program features. At the other extreme, country differences are large for items concerning access to services, including those for postpartum family planning services in both rural and urban areas.

Respondent Agreement

Respondents completed the questionnaire individually, and all data were entered separately for each respondent. Standard deviations were used to assess the degree of respondent agreement in each country, on each of the 81 items. All standard deviations were averaged across the 55 countries, again for each item. The resulting patterns provide an overall impression of which items tended to be similarly scored and which encountered a good deal of respondent disagreement.

Agreement was exceptionally close for program features that concerned antenatal delivery and neonatal services, most of which had high scores. Fifteen of the sixteen items with the closest agreement concerned these components. Three of the best five items were for immunizations of mother or infant, and two other items with good agreement concerned the public's access to the antenatal and delivery services. These features also received rather high scores (note that a relationship exists between a high score and

respondent agreement because a high score cannot occur if the ratings vary greatly). Therefore, these results show that most respondents in most countries agreed fairly closely in rating these components relatively high, which strengthens the impression that they deserve such a ranking.

Other items encountered considerable disagreement, but they did not fall into just a few categories as the items above did. Instead they involved several different components. Some concerned facility capacities at both health center and district hospital levels, while a few concerned access to care, training, evaluation, or policies. Reasons for highly varied responses on certain items include lack of good information, varying perspectives as a result of differences in professional or institutional backgrounds, or confusion in understanding the item because of the way it was worded.

Discussion

The method of expert observers as applied in 1999 and 2002 to 49 and 55 countries, respectively, that encompass most of the developing world, appears to yield useful measures of program features directed to maternal health. Additional confidence in the method comes from the close similarity of the score profiles across the 13 components of effort in the two years. In addition, the small but consistent improvements of scores across these components lend credibility to the results. The general approach offers the advantages of common measures across a range of program elements, for many countries, at approximately the same time, and at low cost.

A question remains as to the internal coherence of the 13 major components of the MNPI index. To address this question an exploratory factor analysis was conducted on the 81 individual items in 1999, with each item averaged over all countries (Bulatao and Ross, 2003b). The outcomes distinguished four major blocks of items, within which 11 of the 13 components were further distinguished, as follows:

- Block 1, "Policy and Support Services," contained the separate components of policy, monitoring, health promotion, and training
- Block 2, "Facility Capacity," contained health centers and district hospitals
- Block 3, "Access to Services, contained rural access and urban access
- Block 4, "Care Received," contained antenatal, delivery, and newborn care

Regarding the remaining components, resources (based upon three somewhat disparate items) was not distinguished separately, and family planning was distinguished basically by contraceptive method. Overall, it is reassuring that the components emerged close to their original form, in a pattern that followed the questionnaire construction.

Maternal mortality ratios have been shown to be associated cross-nationally with the 1999 MNPI scores, as well as with socioeconomic variables, although the maternal mortality ratios are subject to wide confidence intervals (Bulatao and Ross, 2003a). It is not surprising that countries with strong programs and better social settings have lower mortality risks, but it is helpful to have measures of program effort that are common to many countries to test such associations.

Besides the maternal mortality *ratio*, which relates maternal deaths to all births, another measure of program effect is the maternal mortality *rate*, which is the number of maternal deaths per year per 1,000 women aged 15–49. An advantage of this measure is that it captures reductions in the absolute numbers of pregnancies, and, therefore, maternal deaths, when contraceptive use increases.

The results indicate that international change in maternal health programs has not been rapid over the three years from 1999 to 2002; the total score changed less than one point (0.73) per year. In contrast, the total score from the family planning effort studies rose by 1.32 points per year from 1994 to 1999 (1.26 points per year from 1972 to 1999). From one standpoint, the slower MNPI pace might have been expected, but even the most vital short-term feature, access to care, improved by only 0.9 point per year, and there is no sign here of fundamental changes that might lower the high mortality risks associated with pregnancy in the developing world.

It is clear that maternal health programs in many developing countries have serious deficiencies, as testified both by the rather mediocre total scores and by the uneven emphasis given to the various components. While policy positions rate well, the associated action plans are especially weak, and their implementation suffers, as seen in the limited capacities of health centers and district hospitals and in the limited breadth of services provided to the public.

Particular concerns relate to the poor access that rural populations have to maternal services. Even if the facilities themselves are excellent, this means little if they are distributed poorly and if most emergency cases cannot reach them. A similar finding comes from the studies of access to family planning services, where, in a set of 30 program features, the poorest scores concerned the proportion of the population with ready access to oral contraceptives, IUDs, male and female sterilization, condoms, and safe abortion (Ross and Mauldin, 1996). Studies of coverage for HIV services find that most people in low- and middle-income countries do not have access to several key prevention and care services and that those services that are available exist usually in urban—but not rural—areas (WHO, 2002; USAID et al., 2004).

HIV/AIDS scores are especially low, even after some improvement between 1999 and 2002. Family planning provision, which can reduce the numbers of unwanted pregnancies among HIV-positive persons and can avert more infections through condom use, scores only about average, and the score is only 41 percent for rural access to postpartum contraception. There is considerable room for the expansion of preventive services because the scores are relatively high for contacts with women at antenatal, delivery, and infant care visits.

The four uses of the MNPI Index as listed at the outset can be considered in light of these results. The two rounds so far provide *descriptions* not previously available, and these have been made available to each participating country and to a variety of international agencies. The profiles of the scores support *diagnoses* of relative strengths and weaknesses; for example, newborn care including immunizations is ranked highest and rural access to services is ranked lowest. National and regional agencies can now engage in *planning* more rationally than before, based on the variety of new information on program features and the pace of change in each. Finally, advocacy groups can draw upon the results for *stimulating* stronger programs, better financing, and closer attention to maternal mortality.

However, it is clearly easier and less costly to improve certain program features than others. Better rural access may be the most difficult of all, as it depends heavily upon the infrastructures of better transportation for emergency cases, rapid communication, and higher quality service at the peripheral health centers. On the other hand, the central supporting functions of good policy positions, information, training, and monitoring should, in theory, be easiest and least costly; for those, the barriers are ones of political will, leadership, and staff skills.

Geographically, much of the developing world's population lives in a few countries that rate especially poorly. Among the eight largest countries, scores are below average in India, Pakistan, Bangladesh, Indonesia, and Nigeria, which together contain 52 percent of the developing world outside of China. Half of the population in sub-Saharan Africa lives in only five of the 49 countries in that region. This pattern of geographic concentration is significant for the planning strategies of regional and international supporting agencies.

Appendices

Appendix A. Item Values for 1999 and 2002, with Ranks for 2002, by Component

Component	2002	1999	Difference	Rank in 2002
Facility Capacities to Provide Maternal Health Services				
1. At Health Centers, Trained Staff				
Administer antibiotics intravenously	65.1	61.4	3.7	26
Manage postpartum hemorrhage	54.6	52.0	2.6	55
Have adequate antibiotic supplies	55.4	51.8	3.6	52
Manually remove retained placenta	51.0	48.6	2.4	62
Use partograph to determine when to refer	50.3	45.4	4.9	64
Arrange transport in cases of obstructed labor	49.1	43.4	5.7	66
Perform manual vacuum aspiration or electric suction	29.0	24.3	4.7	80
Mean	**51.3**	**46.7**	**4.6**	
2. At District Hospitals, Trained Staff				
Provide all functions listed for health centers	67.9	66.8	1.1	20
Perform caesarean sections or related surgery	63.9	64.1	-0.2	29
Perform blood transfusions	56.3	52.5	3.8	48
Mean	**62.8**	**61.1**	**1.7**	
3. Percentages of Pregnant Women with Access to Maternal Health Services				
3a. Rural Access				
District hospitals open 24 hours	55.8	57.7	-1.9	49
Antenatal care	59.6	56.3	3.3	35
Delivery care by trained professional attendant	47.2	43.9	3.3	68
Postpartum family planning services	41.4	36.4	5.0	72
Treatment for postpartum hemorrhage	39.3	34.8	4.5	74
Management of obstructed labor	38.1	33.1	5.0	76
Treatment of complications of abortion	37.2	32.0	5.2	78
Provision of safe abortion services	25.4	21.1	4.3	81
Mean	**42.4**	**39.4**	**3.0**	
3b. Urban Access				
District hospitals open 24 hours	81.9	81.3	0.6	1
Antenatal care	79.1	79.9	-0.8	4
Delivery care by trained professional attendant	75.3	75.5	-0.2	7
Postpartum family planning services	64.5	60.8	3.7	27
Treatment for postpartum hemorrhage	68.4	68.6	-0.2	18
Management of obstructed labor	69.8	69.0	0.8	14
Treatment of complications of abortion	68.5	68.0	0.5	16
Provision of safe abortion services	48.2	44.7	3.5	67
Mean	**69.0**	**68.5**	**0.5**	

Component	2002	1999	Difference	Rank in 2002
Maternal and Neonatal Healthcare Received				
4. Care Received at Antenatal Visits				
Tetanus injections as required	79.4	78.4	1.0	3
Examination and treatment for hypertension	73.6	70.2	3.4	8
Iron folate tablets for anemia	73.2	65.8	7.4	10
Information on danger signs	63.6	59.6	4.0	31
Examination and treatment for syphilis	56.7	51.5	5.2	46
Voluntary HIV counseling and testing offered	38.4	29.8	8.6	75
Mean	**64.2**	**59.2**	**4.9**	
5. Care Received at Delivery				
Encouragement to start breast feeding immediately	75.7	74.3	1.4	6
Counseling on care of umbilical cord	68.2	65.9	2.3	19
Checking for hypertension, anemia, infection	62.7	59.9	2.8	33
Seen by trained professional attendant	57.5	56.0	1.5	43
Can receive emergency obstetric care	58.2	55.5	2.7	39
Monitoring of labor	55.7	52.5	3.2	50
Scheduled for check-up in 48 hours	43.9	41.2	2.7	70
Mean	**60.2**	**57.9**	**2.3**	
6. Care Received for Neonates				
Scheduled for subsequent immunizations	79.4	78.5	0.9	2
Diphtheria-tetanus-pertussis injection at three months	77.6	76.5	1.1	5
Umbilical cord cut with clean blade	73.5	72.7	0.8	9
Dried and kept warm	72.9	72.5	0.4	12
Mouth and nasal passageways cleared	68.5	68.5	0.0	17
Prophylactic eye treatment	59.1	57.3	1.8	37
Mean	**72.1**	**71.0**	**1.1**	
7. Family Planning Provision by Health Centers				
Have contraceptive pills consistently in stock	66.3	65.7	0.6	23
Routinely offer family planning after delivery	63.6	59.3	4.3	32
Can insert intrauterine devices	55.5	56.7	-1.2	51
Routinely offer family planning after abortion	55.1	51.4	3.7	53
Have progestin-only pills for breast-feeding women	54.2	48.7	5.5	57
Mean	**58.6**	**56.4**	**2.2**	
8. Family Planning Provision by District Hospitals				
Have contraceptive pills consistently in stock	66.6	67.3	-0.7	21
Routinely offer family planning after delivery	64.2	61.5	2.7	28
Can insert intrauterine devices	68.8	70.7	-1.9	15
Routinely offer family planning after abortion	58.4	56.1	2.3	38
Can offer sterilization to females	57.9	61.9	-4.0	42
Can offer sterilization to males	35.5	35.7	-0.2	79
Mean	**58.5**	**58.9**	**-0.4**	

Component	2002	1999	Difference	Rank in 2002
Policy and Support Services				
9. Policies				
Adequate health ministry policies	72.2	72.5	-0.3	13
Service director at high administrative level	65.1	66.9	-1.8	25
Appropriate personnel allowed to provide services	66.6	63.6	3.0	22
Policies developed through adequate consultation	66.1	63.6	2.5	24
High-ranking officials issue frequent statements of support	59.6	58.3	1.3	36
Policies favor treatment of complications of abortion	56.8	54.8	2.0	45
High-level policy reviews and action plans	55.0	53.9	1.1	54
Mean	**63.5**	**61.9**	**1.6**	
10. Resources				
Active private sector	57.9	58.5	-0.6	41
Adequate budget	49.3	48.1	1.2	65
All services and drugs free	37.7	35.0	2.7	77
Mean	**48.2**	**47.2**	**1.0**	
11. Health Promotion				
Ministry supplies educational materials	54.0	48.4	5.6	58
Community organizations educate public	51.5	48.4	3.1	61
Media-based education on complications	50.6	48.3	2.3	63
Media-based education on harmful practices	46.1	42.6	3.5	69
Mean	**50.5**	**46.9**	**3.6**	
12. Training				
Medical curricula include hands-on training	73.1	72.8	0.3	11
Midwife and nurse refresher training within five years	57.3	55.3	2.0	44
Doctor refresher training within five years	54.3	52.9	1.4	56
New midwives and nurses trained in six months	43.0	42.6	0.4	71
New doctors trained to manage normal deliveries	41.1	41.3	-0.2	73
Mean	**53.5**	**53.0**	**0.5**	
13. Monitoring and Research				
Surveys provide data on maternal events	63.8	64.1	-0.3	30
Statistical reporting system	60.1	56.9	3.2	34
Statistics used for decisions and strategy	58.1	56.2	1.9	40
Central monitoring and analysis of statistics	56.5	54.0	2.5	47
Updated listing of facilities	53.9	52.9	1.0	59
Each hospital reviews maternal deaths	51.6	49.8	1.8	60
Mean	**57.1**	**55.7**	**1.4**	

Appendix B. 2002 Ratings by Country and Component*

Country/Region	Capacities of health centers	Capacities of district hospitals	Rural Access	Urban Access	Total Access†	Care at antenatal visits	Care at delivery	Care for newborns	Family planning at health centers	Family planning at district hospitals	Policies toward safe pregnancy	Resources	Information, education	Training arrangements	Monitoring, evaluation	Total Score (Mean)
East and Southeast Asia																
China	63.5	68.7	70.7	93.9	78.1	54.1	71.3	75.0	65.6	79.0	78.8	40.5	69.6	73.2	78.5	68.9
Indonesia	51.0	64.8	52.4	75.8	61.1	50.2	61.8	65.8	59.4	65.7	61.8	44.3	54.3	47.1	56.2	57.2
Myanmar	57.4	77.4	52.2	81.0	60.0	72.0	68.6	76.4	57.8	55.9	63.3	56.7	63.8	70.2	65.4	65.0
Philippines	35.3	48.5	58.3	82.0	71.5	59.1	66.0	76.1	63.0	64.3	67.5	53.9	51.8	59.9	60.0	59.8
Vietnam	55.6	70.0	77.4	92.7	80.4	67.0	73.2	82.5	66.7	76.1	73.5	59.3	69.2	67.2	68.8	70.0
Region Mean	**52.6**	**65.9**	**62.2**	**85.1**	**70.2**	**60.5**	**68.2**	**75.1**	**62.5**	**68.2**	**69.0**	**50.9**	**61.8**	**63.5**	**65.8**	**64.2**
South Asia																
Bangladesh	54.5	76.3	38.1	63.9	43.0	56.2	44.9	60.9	50.3	60.6	64.7	50.3	55.5	55.7	48.5	55.5
India	41.6	58.8	41.9	72.9	49.7	51.8	44.4	57.4	51.1	68.2	56.5	56.1	48.5	57.9	53.3	53.5
Nepal	45.2	48.9	22.6	51.5	25.8	53.9	47.2	62.8	55.2	67.0	68.3	50.4	64.2	55.9	59.3	54.2
Pakistan	40.1	51.2	20.3	48.6	30.2	38.3	34.4	47.0	33.1	43.5	41.0	44.8	38.0	30.7	33.2	38.9
Region Mean	**45.4**	**58.8**	**30.7**	**59.2**	**37.2**	**50.0**	**42.7**	**57.0**	**47.4**	**59.8**	**57.6**	**50.4**	**51.5**	**50.1**	**48.6**	**50.5**
Latin America and the Caribbean																
Bolivia	60.2	56.0	28.5	52.1	43.1	67.0	65.5	79.3	57.5	54.5	61.0	65.3	46.8	61.2	57.7	59.6
Brazil	40.8	67.1	44.9	75.1	69.1	63.1	64.3	74.3	37.8	44.0	60.4	47.1	37.9	44.3	55.0	54.2
Dominican Republic	45.2	59.5	42.0	66.9	57.7	65.2	56.9	66.3	40.3	34.8	53.1	46.1	29.5	46.0	55.0	50.4
Ecuador	46.4	62.4	29.3	69.9	53.7	70.1	67.4	81.3	65.3	68.2	67.9	66.7	44.4	56.8	59.0	62.3
El Salvador	63.1	62.8	34.9	68.4	50.3	75.5	67.5	78.8	72.7	79.5	61.6	42.4	37.7	68.7	74.2	64.2
Guatemala	34.4	50.0	30.4	56.3	40.7	52.2	43.6	61.2	40.9	50.3	46.6	42.6	30.0	52.2	43.8	45.3
Haiti	38.8	43.8	20.6	43.9	28.3	54.8	49.6	60.4	46.8	50.1	50.8	35.4	35.0	42.4	41.6	44.4
Honduras	66.7	73.5	67.0	78.7	72.3	79.5	78.5	92.8	70.1	74.4	71.0	67.7	65.0	73.8	59.9	72.7
Mexico	43.0	71.1	59.6	73.7	70.0	61.9	64.3	79.4	59.9	72.8	59.3	49.4	48.3	53.8	69.2	61.7
Nicaragua	43.1	54.0	29.0	68.4	53.8	55.9	57.6	72.2	54.1	55.2	44.9	39.0	35.2	61.7	51.9	52.2

* All ratings on a 0–100 scale.

† Total Access is a population-weighted average of rural and urban access. The total score uses the "Total Access" score.

Country/Region	Capacities of health centers	Capacities of district hospitals	Rural Access	Urban Access	Total Access[†]	Care at antenatal visits	Care at delivery	Care for newborns	Family planning at health centers	Family planning at district hospitals	Policies toward safe pregnancy	Resources	Information, education	Training arrangements	Monitoring, evaluation	Total Score (Mean)
Panama	63.9	87.1	65.8	94.0	83.3	89.8	83.5	93.4	74.4	76.9	74.6	48.8	52.8	72.7	77.9	75.3
Paraguay	46.2	53.9	35.7	64.3	51.1	56.5	53.1	68.7	54.1	51.0	49.6	34.5	34.4	41.9	44.2	49.2
Region Mean	**49.3**	**61.8**	**40.6**	**67.6**	**56.1**	**65.9**	**62.6**	**75.7**	**56.2**	**59.3**	**58.4**	**48.8**	**41.4**	**56.3**	**57.4**	**57.6**
Middle East and North Africa																
Algeria	55.7	79.3	36.6	93.8	69.2	43.0	60.3	66.3	43.1	53.0	50.0	54.7	39.5	53.6	40.7	54.5
Egypt	46.1	72.1	54.3	74.2	63.2	53.7	58.5	78.4	67.4	54.4	70.9	66.7	59.8	55.8	60.7	62.1
Iran	67.8	86.7	80.6	96.1	89.9	85.4	85.4	88.9	88.3	80.0	57.3	60.9	56.7	68.9	68.8	75.8
Jordan	38.6	82.4	72.3	80.2	78.5	60.5	70.7	84.4	66.3	60.7	61.0	62.4	51.4	54.4	53.9	63.5
Morocco	58.8	71.4	44.3	74.6	61.0	70.9	58.7	77.5	84.8	59.6	65.2	54.4	55.6	64.2	69.9	65.5
W. Bank	55.9	79.3	57.3	81.0	76.3	53.9	62.6	78.9	56.7	44.3	58.3	53.5	49.7	52.5	50.0	59.4
Yemen	32.7	58.1	31.4	66.6	43.7	43.3	43.4	62.9	52.0	49.0	62.6	36.8	50.0	43.6	42.9	47.8
Region Mean	**50.8**	**75.6**	**53.8**	**80.9**	**68.8**	**58.7**	**62.8**	**76.8**	**65.5**	**57.3**	**60.8**	**55.6**	**51.8**	**56.1**	**55.3**	**61.2**
Anglophone Sub-Saharan Africa																
Angola	46.5	31.7	35.1	63.7	45.9	78.0	49.6	58.5	70.9	49.3	63.1	45.1	56.9	42.5	50.5	53.0
Botswana	84.2	71.4	64.6	91.6	77.8	89.0	85.0	95.3	89.8	80.8	79.6	80.5	80.5	67.4	74.5	81.2
Ethiopia	34.7	39.2	19.2	39.5	22.4	46.1	38.2	50.7	51.4	48.4	51.7	34.1	30.7	33.3	40.5	40.1
Ghana	54.5	66.2	41.3	74.3	53.5	70.1	60.6	72.3	71.5	66.9	77.8	54.2	57.5	58.6	67.0	63.9
Kenya	40.3	56.8	45.6	65.8	51.7	57.5	47.0	62.5	59.0	65.5	57.3	37.8	34.3	37.0	41.4	49.9
Mozambique	55.8	65.5	39.5	79.6	54.0	62.4	69.1	78.2	65.8	59.4	69.9	46.7	47.3	64.4	70.2	62.2
Namibia	54.6	84.8	71.4	89.2	76.2	85.8	79.0	88.4	80.5	79.7	64.4	77.5	58.6	67.1	82.7	75.3
Nigeria	56.2	62.2	38.9	64.5	49.4	70.3	66.2	75.4	57.0	56.9	69.9	46.4	54.8	47.3	52.6	58.8
South Africa	65.3	70.3	54.8	86.9	70.8	78.3	72.3	83.6	73.8	71.7	70.3	65.1	54.4	59.7	73.7	69.9
Sudan	31.1	52.9	47.7	60.3	51.8	43.8	42.4	58.6	54.0	38.6	41.3	36.5	37.0	41.4	28.6	42.9
Tanzania	50.7	71.6	38.9	62.4	45.0	66.8	56.1	68.1	62.0	64.4	70.5	56.5	56.8	56.4	66.3	60.9
Uganda	54.7	70.0	46.1	67.9	48.9	66.5	59.6	68.0	58.0	59.0	70.0	59.7	65.4	58.6	60.8	61.5
Zambia	37.0	59.0	39.6	69.2	52.6	60.8	55.4	66.5	59.2	59.8	63.9	46.0	63.3	50.4	55.6	56.1

Country/Region	Capacities of health centers	Capacities of district hospitals	Rural Access	Urban Access	Total Access[†]	Care at antenatal visits	Care at delivery	Care for newborns	Family planning at health centers	Family planning at district hospitals	Policies toward safe pregnancy	Resources	Information, education	Training arrangements	Monitoring, evaluation	Total Score (Mean)
Zimbabwe	55.4	57.9	53.6	78.4	61.8	74.6	76.2	81.8	70.2	59.6	69.2	48.1	53.2	55.3	71.8	64.2
Region Mean	**51.5**	**61.4**	**45.5**	**71.0**	**54.4**	**67.9**	**61.2**	**72.0**	**65.9**	**61.4**	**65.6**	**52.4**	**53.6**	**52.8**	**59.7**	**60.0**
Francophone Sub-Saharan Africa																
Benin	60.0	64.7	54.4	72.4	61.6	68.3	57.7	72.6	62.6	63.3	75.0	42.3	48.2	50.3	65.7	61.0
Burkina Faso	55.4	58.2	35.0	64.2	39.4	65.9	55.3	67.9	66.9	61.3	66.4	37.2	51.2	50.1	56.3	56.3
Cameroon	56.6	58.1	39.1	66.5	52.2	78.9	67.3	77.1	47.4	64.9	73.0	41.6	59.5	46.5	58.0	60.1
Chad	34.5	43.3	19.9	29.3	21.9	52.7	49.4	59.3	34.8	32.0	61.1	32.7	46.0	46.8	46.3	43.1
Congo	46.1	51.1	12.0	17.7	15.4	64.1	58.4	73.0	44.2	35.5	59.8	37.4	38.9	40.2	27.1	45.5
Congo, Dem. Rep. Of	41.2	53.3	26.8	49.8	33.4	58.7	58.8	67.7	34.1	37.7	57.1	30.3	36.6	43.4	45.2	46.0
Cote d'Ivoire	53.0	63.8	32.8	60.0	45.3	68.8	54.6	76.3	44.0	45.8	63.9	35.4	45.6	38.4	46.3	52.4
Guinea	53.3	60.0	34.9	63.0	43.6	73.1	59.3	72.9	55.3	54.7	72.3	34.4	57.8	52.2	61.0	57.7
Madagascar	62.3	62.4	28.0	56.6	36.0	65.2	56.3	72.3	59.7	60.0	75.4	43.6	55.4	63.2	62.2	59.5
Mauritania	65.4	48.8	26.9	71.7	51.5	71.9	63.4	67.3	59.9	42.9	63.6	40.0	41.0	44.8	52.8	54.9
Niger	52.9	53.2	26.3	70.4	33.8	61.7	46.3	58.5	51.0	48.6	61.2	34.6	53.3	46.7	58.5	50.8
Rwanda	62.9	75.0	34.5	70.8	36.7	70.8	57.9	75.8	40.2	53.3	69.1	40.2	59.8	45.8	58.4	57.4
Senegal	67.3	68.2	25.6	67.2	44.4	76.2	64.7	69.7	62.8	64.7	72.6	38.9	56.8	50.8	66.0	61.8
Region Mean	**54.7**	**58.5**	**30.5**	**58.4**	**39.6**	**67.4**	**57.7**	**70.0**	**51.0**	**51.1**	**67.0**	**37.6**	**50.0**	**47.6**	**54.2**	**54.3**
Mean for All Countries	**51.3**	**62.8**	**42.4**	**69.0**	**53.3**	**64.2**	**60.2**	**72.1**	**58.6**	**58.5**	**63.5**	**48.2**	**50.5**	**53.5**	**57.1**	**58.0**

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